Claims

1   1.   A system for transmitting signal packets, each of the packets having a destination address,

2   from a source to two or more destinations, the system comprising:

3   a router having at least two address groups, said router coupled to receive packets, and to

4   map each packet destination address to one of the address groups; and

5   a tunnel source having an input coupled to said router and having an output and wherein

6   for the packets having an original destination address which belongs to the first address group of

7   said router, the tunnel source assigns each packet it receives to one of a plurality of addresses,

8   each address being associated with a tunnel destination wherein each one of the tunnel

9   destination addresses is mapped to an output channel and wherein for packets having an original

10   destination address belonging to the second address group of said router are mapped onto a single

11   output channel based upon their original address.

1   2.   The system of claim 1 wherein a new address of a packet is based upon the state of the

2   output channels.

1   3.   The system of claim 1 wherein a new address of a packets is based upon Quality of

2   Service requirements.

1   4.   The system of claim 1 where a new address of a packet is based upon traffic demands.

1   5.   The system of claim 1 wherein:

2   said tunnel source corresponds to an IP tunnel source; and

3   said tunnel destination corresponds to an IP tunnel destination.

1   6.   A method for transmitting signal packets from a source to two or more destinations, the

2   method comprising:

3   receiving a plurality of packets in a router, each of the packets having a destination

4 address,

5   mapping the destination address of each packet to one of a plurality of address groups in

6 the router; and

7   for each packet, determining to which of the plurality of address groups in the router an

8 original destination address of the packet belongs;

9   in response to the original destination address of the packet belonging to a first address

10 group of the router, assigning each received packet to one of a plurality of addresses, each

11 address being associated with a tunnel destination address with each one of the tunnel destination

12 addresses being mapped to an output channel

1 7.   The method of claim 6 wherein in response to the original destination address of the

2 packet belonging to a second address group of the router, mapping the original destination

3 address of the packet onto a single output channel.

1 8.   The method of claim 6 wherein assigning each received packet to one of a plurality of

2 addresses includes assigning an address of a packet based upon the state of the output channels.

1 9.   The method of claim 6 wherein assigning each received packet to one of a plurality of

2 addresses includes assigning an address of a packet based upon Quality of Service requirements.

1 10.   The method of claim 6 wherein assigning each received packet to one of a plurality of

2 addresses includes assigning an address of a packet based upon traffic demands.

1 11.   The system of claim 6 wherein:

2   said tunnel source corresponds to an IP tunnel source; and

3   said tunnel destination corresponds to an IP tunnel destination.

1 12.   An address allocation method comprising:

2   originating a packet at a first source address S, each of the packets having a destination

3   address D wherein address D is an element of an address space F;

4   receiving the packet at a tunnel source wherein the tunnel source is coupled to a cable

5   modem termination system (CMTS) via an interface having a first IP address (T1);

6   determining in the tunnel source that the packet has a destination address D which is an

7   element of an address space F;

8   in response to the tunnel source determining that the packet has a destination address D

9   which is an element of an address space F, dividing the packet into a plurality of sub-packets;

10   encapsulating each of the plurality of sub-packets, each of the encapsulated sub-packets

11   having a source address and a destination address which define a tunnel between the tunnel

12   source and a tunnel destination;

13   mapping each tunnel destination address onto a corresponding one of a plurality of cable

14   channels; and

15   routing the encapsulated sub-packets via the appropriate tunnel to the tunnel destination.

1   13.   The method of claim 12 further comprising:

2   receiving the encapsulated sub-packets at the tunnel destination;

3   combining the channels to provide the original packets; and

4   forwarding the packets in their original order to the destination.

1   14.   The method of claim 13 wherein combining the channels comprises removing the

2   encapsulation headers from each of the encapsulated sub-packets to again provide the original

3   packets.

1   15.   The method of claim 14 wherein encapsulating comprises:

2   generating a new packet having a payload field;

3   placing the original packet in the payload field of the new packet; and

4   adding a new packet header to the new packet with the new packet header having a source

5   address corresponding to the address T1 and a destination address corresponding to one of a

6   plurality of separate IP interfaces on the tunnel destination and wherein the destination address is

7   part of an L address space and wherein each address pair formed by the source address of the new

8   packet header and the destination address of the tunnel defines a separate tunnel.